

Argiolestes zane sp. nov. from New Guinea (Odonata: Argiolestidae)

MĀRTIŅŠ KALNIŅŠ

The Entomological Society of Latvia, Dzērveņu iela 9-12, Siguldas novads, LV-2150, Sigulda, Latvia; martins.kalnins@biology.lv

Abstract: A new species of *Argiolestes* is described: *Argiolestes zane* sp. nov. (type locality: Indonesia, West Papua, S Bird's Neck, east from Kaimana, Triton bay, Lobo village environment, deposited LINC). Ecological notes on habitat (forest brooks) of holotype and paratypes localities are given.

Key words: Odonata, dragonfly, Zygoptera, Megapodagrionidae, Argiolestidae, *Argiolestes*, taxonomy, New Guinea.

Introduction

Quite recently the former subfamily Argiolestinae of family Megapodagrionidae was raised to family level (Kalkman, Theischinger 2013). The genus *Argiolestes* Selys, 1862, currently includes 11 species, found on New Guinea and adjacent islands, the northern Moluccas and on Sulawesi. Most species appear to have small ranges and none are known from more than five records (Kalkman, Theischinger 2013). The type species of *Argiolestes* is *A. australis* (Guérin-Meneville, 1830).

In this article a new species of *Argiolestes* is described, also concise ecological notes are given.

Material and methods

Specimens described below were collected using an insect net during hiking along the riverside in River Lengguru valley, in Lobo and Oray villages environment (West Papua, S Bird's Neck isthmus, Kaimana 40 km E, Triton bay), when all brooks along the small (~1 m wide) footpath were inspected. The footpath was located in the valley of lower reaches of the large river. The river valley covered by primeval lowland rainforest, except relatively small areas covered by secondary lowland rainforest and gardens around the villages and forest houses. Forest was wet with numerous small brooks and pools. Approximately 100-200 m long stretches were investigated in every brook. All visually observed or disturbed specimens were collected. Inspections were made during daytime (from 9 to 15 o'clock) in sunny weather, with temperature in forest shadow

+25-30°C. Information on habitat - rainforest type, dominant vegetation, brook width and flow was collected.

All specimens were preserved in 70 % ethanol. They were studied using a Leica S6D stereomicroscope. Specimen and habitat photographs in the field were taken using an Olympus E-500 camera, in the laboratory - using a Canon EOS 450D SLR camera attached to the microscope, and Combine-ZP software was used for image stacking. Holotype and paratypes of the new species are currently deposited in the Latvian Invertebrate collection (LINC) in Sigulda, Latvia. The holotype will be deposited in a publicly funded institution in the future.

All label data are reproduced exactly, with no corrections or additions. All labels are printed on orange paper, meaning invertebrate caught outside of the territory of Latvia.

The following abbreviations are used:

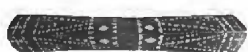
LINC - Latvian Invertebrate collection (author's collection), Sigulda, Latvia;

Fw - forewings;

Hw - hindwings.

Unique characteristics within Argiolestidae

The males of the genus *Argiolestes*, previously considered as *Argiolestes* s. str. (Kalkman et al. 2010), have several well marked characters different from other species of Argiolestidae (Kalkman & Theischinger 2013):



- the two apical lobes of the genital ligula are at least four times as long as broad;
- part of S10 and cerci are pale (whitish or blue in life) contrasting with darker S9 (clearly visible in the field). This is only visible in fully mature specimens and is more easily seen in living individuals;
- base of cercus possesses a basal flange in all species except *A. celebensis* Kalkman, 2007 and *A. tuberculiferus* Michalski, Oppel, 2010 (Kalkman 2007; Michalski, Oppel 2010).

Description of new species

Argiolestes zane sp. nov. (Plates 31-34, map 1)

Holotype ♂ LINC, INDONESIA E, 16.09.2010. West Papua, S Bird's Neck, Kaimana 40 km, E, Triton bay, Lobo vill. env. 03°45'33"S, 134°06'11"E, 20 m; gardens & secondary rainforest on limestone, near small streams Leg. M.Kalniņš.

Paratypes 4♂ LINC, INDONESIA E, 13.09.2010. West Papua, S Bird's Neck, Kaimana 35 km, E, Triton bay, River Lengguru valley at Oray vill. 03°43'26"S, 134°06'06"E, 20 m; 1-2 m wide creek in second. rainforest on limestone Leg. M.Kalniņš.

Derivatio nominis: This species is named after my dear friend, the beautiful Zane Pīpkalēja, who supported me during expeditions to the Wallacea and New Guinea. The name is a person's name in the nominative case (in apposition to the generic name).

The description below is based on the male holotype. This is the same specimen which is shown in Plate 31, fig. 1. The specimen is well preserved, however one leg and the tip of the abdomen (S9-S10 and appendages) are broken off, but all parts are in one tube. One of paratype specimens also has a broken off tip of the abdomen (S8-S10 and appendages), but all parts are also in one tube. Information on color pattern is partly based on the photographs of the living insect, because preserved specimens lost the blue color on thorax and abdomen and partly lost the blue color on the face. The paratype specimens correspond very closely to the holotype and confirm the information given on coloration.

Measurements [mm]: Total body length 44, abdomen (S1-S10, without appendages) 34, Fw 29; Pt in Fw 1.9 (costal length), 2.3 (greatest length); Pt in Hw 2.0 (costal length), 2.4 (greatest length). Head: Labium pale brown with the anterior third shiny dark brown to black. Front of face, including

labrum, mandibles, side margins of postclypeus bluish grey; anteclypeus dark, and lower posterior corner of genae black. The bluish grey color extends along the margin of the eye; remainder of head including antennae dull black (Plate 31, figs 2-3). Thorax: Prothorax dark brown throughout, anterior lobe of pronotum slightly paler, posterior lobe low but raised at the sides and abruptly depressed in the middle; rim with long pale hairs. Ground color of synthorax is black with a clear pattern as shown in Plate 32, fig. 1; pattern grayish-brown in the studied specimen, but blue when alive. Coxae mottled brown, trochanters pale brown, femora pale brown, but black at the knees and with a black stripe laterally. Inner side of femora not flattened. Tibiae and tarsi dark brown to black; spines black. The femora of the first, the second and the third pair of legs with respectively 9, 8, and 10 spines on outer side. Tibiae of first pair of legs with 12 spines on outer side; tibiae of second and third pair of legs with 8 and 10-11 spines on outer side respectively. Fw and Hw hyaline. Venation black. Fw and Hw of equal length and all with 2 Ax. Fw with 23-26 Px; Hw with 18-24 Px. Arculus distal to level of Ax2; discoidal cell in Fw very long, costal side ca 1.5 times as long as distal side, most acute angle ca 40°. Ac closer to Ax1 than to Ax2. Three cells between discoidal cell and subnodus. Pt – pale brown. Almost all cells beyond Pt divided. Up to three rows of cells between anal vein and hind margin of Hw. Fields between IR2 and R3, between R3 and IR3, and between IR3 and R4 containing each three or more rows of cells distally (Plate 32, figs 2-3). Abdomen: S1 and S2 dark brown (black when alive), S2 with ventral half and sides pale brown, S3-S7 dark brown (black when alive) with blue/white marks on sides and ventral part on the anterior fifth. As can be seen on Plate 33 (Fig. 1), the hind margin of S10 was white when the specimen was alive and this would probably be visible in better-preserved specimens. Hind margin of S10 without spines and slightly depressed in the middle. Epiproct upturned and prominent in dorsal view. Superior appendages as in Plate 33 (Figs 1-2). Both superior and inferior appendages white; inferiors ca 2/3 the length of superiors. As can be seen in Plate 33 (Fig. 2), the inferior appendages have two well distinguished bends with a straight or slightly curved stretch in the middle part between them and an obtuse-angled subtriangular apex. Basal flange of superior appendages ca 1/3 the length of superior appendages. Lower apical flange of superior appendages moderately expanded and simple. Upper flange far less prominent and visible mainly due to a row of black blunt denticles. The



apical part of the lower apical flange is divided from the apex of the appendages by a deep incision. Outer border of superior appendages bears two moderately large and one or two small spines. Genital ligula as in Plate 33, fig. 3, with two very long and slender lateral horns.

Differential diagnosis: The male of *A. zane* sp. nov. can be distinguished from all other species of *Argiolestes* by the combination of the largely (including labrum) blue face, the front of synthorax lacking a pair of large, well-defined, marks, up to only three rows of cells between anal vein and hind margin of Hw, the moderately expanded and simple lower apical flange of the superior appendages (nearly identical with *A. roon* Kalkman, Richards, Polhemus, 2010, Fig. 2a in Kalkman et al. 2010), the long (ca 2/3 the length of superior appendages) inferior appendages having two well distinguished bends with straight or slightly curved stretch in the middle part between them and an obtuse-angled triangular apex (similar to *A. muller* Kalkman, Richards, Polhemus, 2010, Fig. 3c in Kalkman et al. 2010).

Ecological notes: What is now the holotype specimen was observed and photographed (and later collected) when resting on dead branches and leaves approximately 0.7 m above the ground, along a small, shallow brook in secondary lowland rainforest, between gardens (Plate 34, fig. 1). The brook was narrow, not exceeding 0.5 m in width at the type locality, and the clear water was flowing strongly through a series of small pools and shallow riffles. The brook runs down a mountain slope, through dense Sago palms *Metroxylon* sp., bamboo and other vegetation and was heavily shaded, with several sunny patches. What are now paratype specimens were collected on a different forest brook (Plate 34, fig. 2) some kilometers from the first, but at the base of the same mountain. This brook was narrow, not exceeding 1.5 m in width, and otherwise very similar to the one described above. It is a small unnamed tributary of the Lengguru River.

Discussion

According to Kalkman & Theischinger (2013) the species of *Argiolestes* occur on New Guinea and adjacent islands, the northern Moluccas and on Sulawesi. The new records of *A. zane* sp. nov. partly fill the gap in presently known distribution of *Argiolestes* on New Guinea between records of *A. roon* on Roon and Mioswaar islands, *A. foja* Kalkman, Richards, Polhemus, 2010 on Foja Mountains

and *A. macrostylis* Ris, 1913 on Lorentz River territory (Ris 1913; Kalkman et al. 2010). However most species of *Argiolestes* Selys seem to have limited distributions and none is known from more than five records (Kalkman, Theischinger 2013).

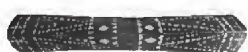
The now known distribution of *Argiolestes* is larger to meanwhile available unidentified specimens from several places on Onin peninsula collected by the author and by Dmitry Telnov (see Map 1). The current finding of *A. zane* sp. nov. complements and confirms current limited information on habitats of the species, that the larvae of *Argiolestes* probably live in seepages and small brooks in rainforest.

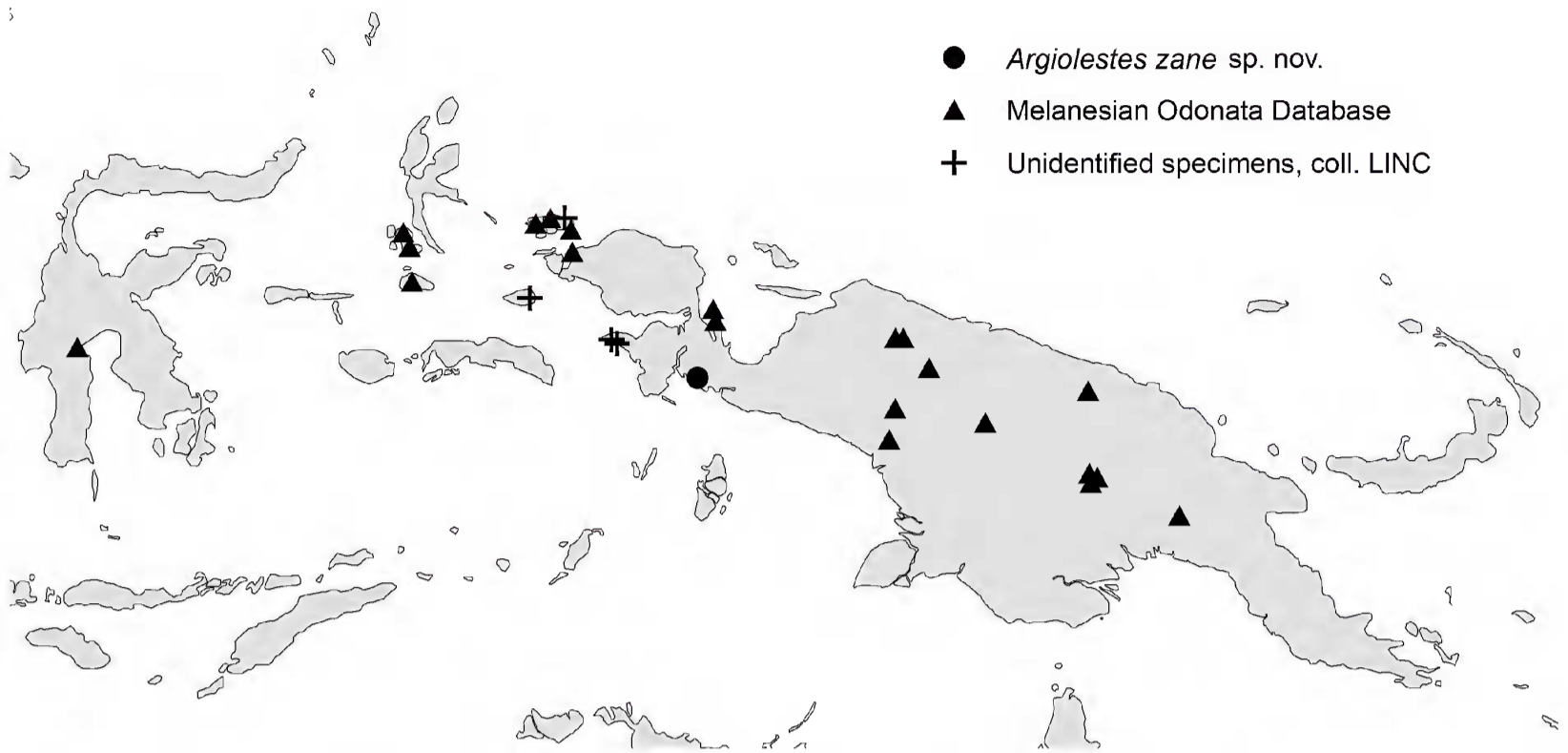
Acknowledgements

I am greatly indebted to Dr. Vincent J. Kalkman (Naturalis Biodiversity Centre, Leiden, the Netherlands) for providing literature on the Australasian region, Dr. Dmitry Telnov (the Entomological Society of Latvia, Rīga) for valuable suggestions useful in the preparation of the final version of the article, Katrīne Latkovska (Rīga, Latvia) for corrections of the article, Māris Lielkalns (Rīga Zoo, Rīga, Latvia) for figure processing, and to Laszlo Wagner (<http://www.east-indonesia.info>) and the local people of Lobo village for guiding and help in expeditions.

References

- Kalkman V.J. 2007. *Argiolestes celebensis* spec. nov. from Sulawesi, Indonesia (Zygoptera: Megapodagrionidae). Notes on Old World Megapodagrionidae 1. – *Odonatologica* **36**: 295-299.
- Kalkman V.J., Richards S.J., Polhemus D.A. 2010. Three new species of *Argiolestes*, with a key to the males of *Argiolestes*. – *International Journal of Odonatology* **13**, No. 1: 75-88.
- Kalkman V.J., Theischinger G. 2013. Generic revision of *Argiolestidae* (Odonata), with four new genera. – *International Journal of Odonatology* **16**, No. 1: 1-52.
- Michalski J., Oppel S. 2010. Two new species of *Argiolestes* from Papua New Guinea (Odonata: Megapodagrionidae). – *International Journal of Odonatology* **13**, No. 1: 63-74.
- Ris F. 1913. Die Odonata von Dr. H.A. Lorentz Expedition nach Südwest-Neu-Guinea 1909 und einige Odonata von Waigeu. – *Nova Guinea: Uitkomsten der Nederlandsche Nieuw-Guinea-Expeditie in 1903, 1907, 1909, 1913, 1920 et 1926*. Volume **17**. Zoology 3: 471-512.





Map 1. Distribution of *Argiolestes* Selys, 1862. Based on records in the Melanesian Odonata Database with locality of *Argiolestes zane* sp. nov. and localities of unidentified specimens (updated from Kalkman, Theischinger 2013).



Plate 31

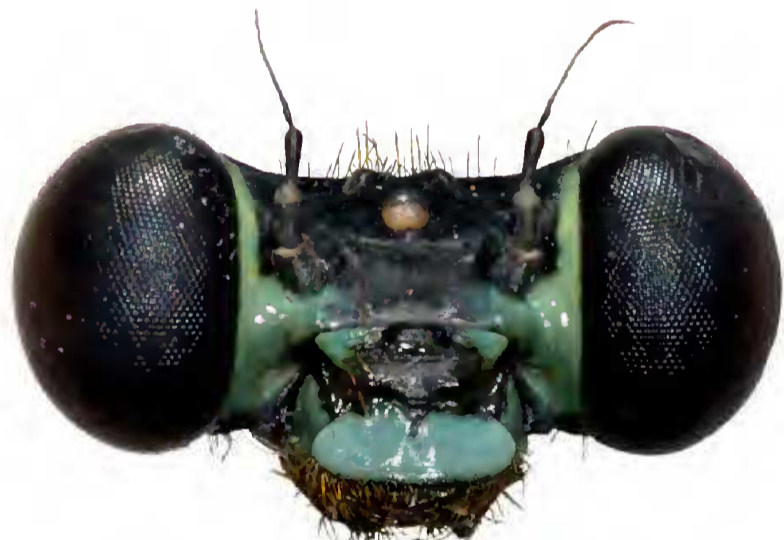
KALNIŅŠ, M.: *Argiolestes zane* sp. nov. from New Guinea (Odonata: Argiolestidae)



1



2

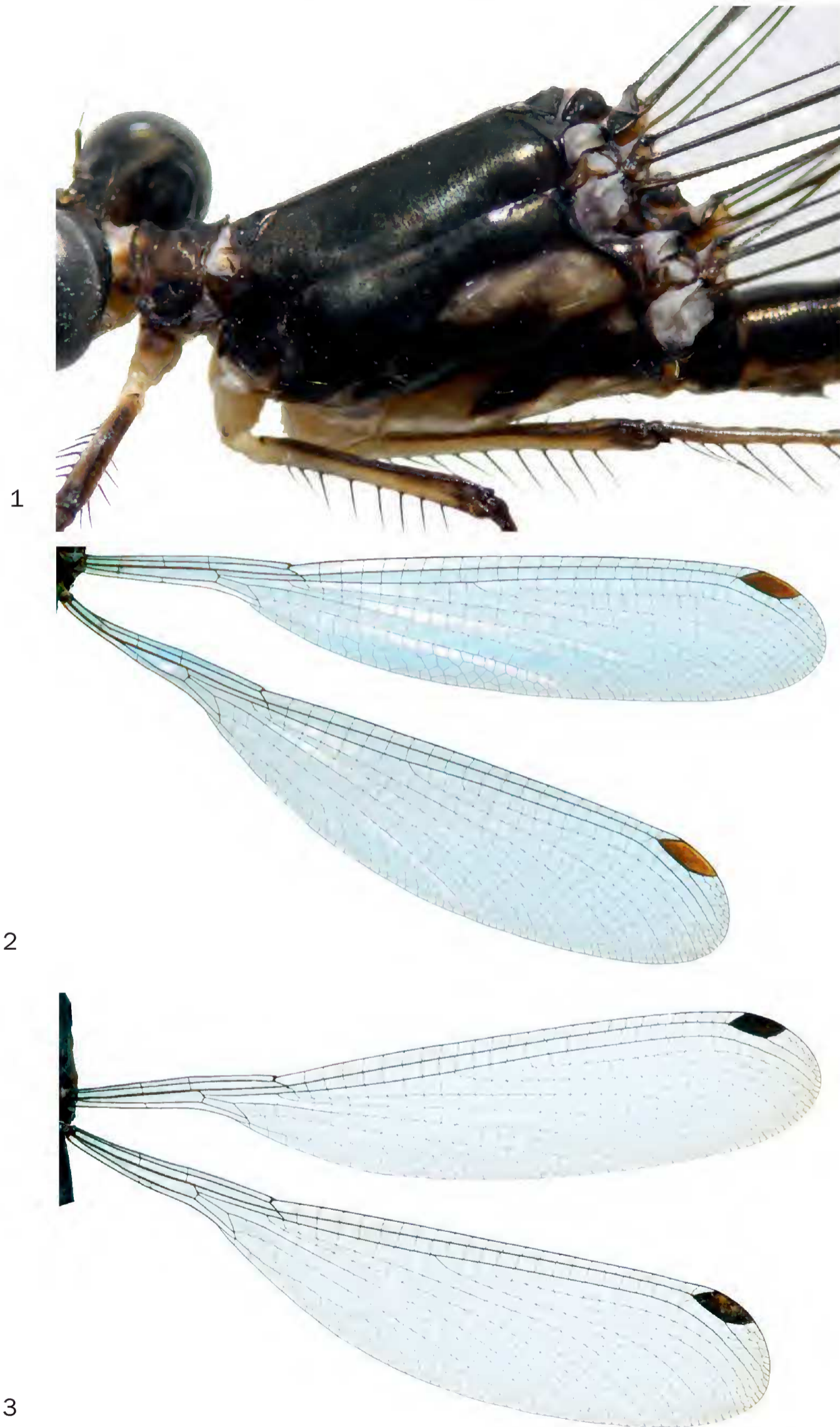


3

Figures 1-3. *Argiolestes zane* sp. nov. 1 – Holotype in its natural environment in Triton Bay near Lobo village, prior being caught (photo: M. Kalniņš); 2 – Head, frontal view (holotype); 3 – Head, frontal view (paratype); this paratypic specimen partly lost its blue coloration, especially along the eyes margins).

Plate 32

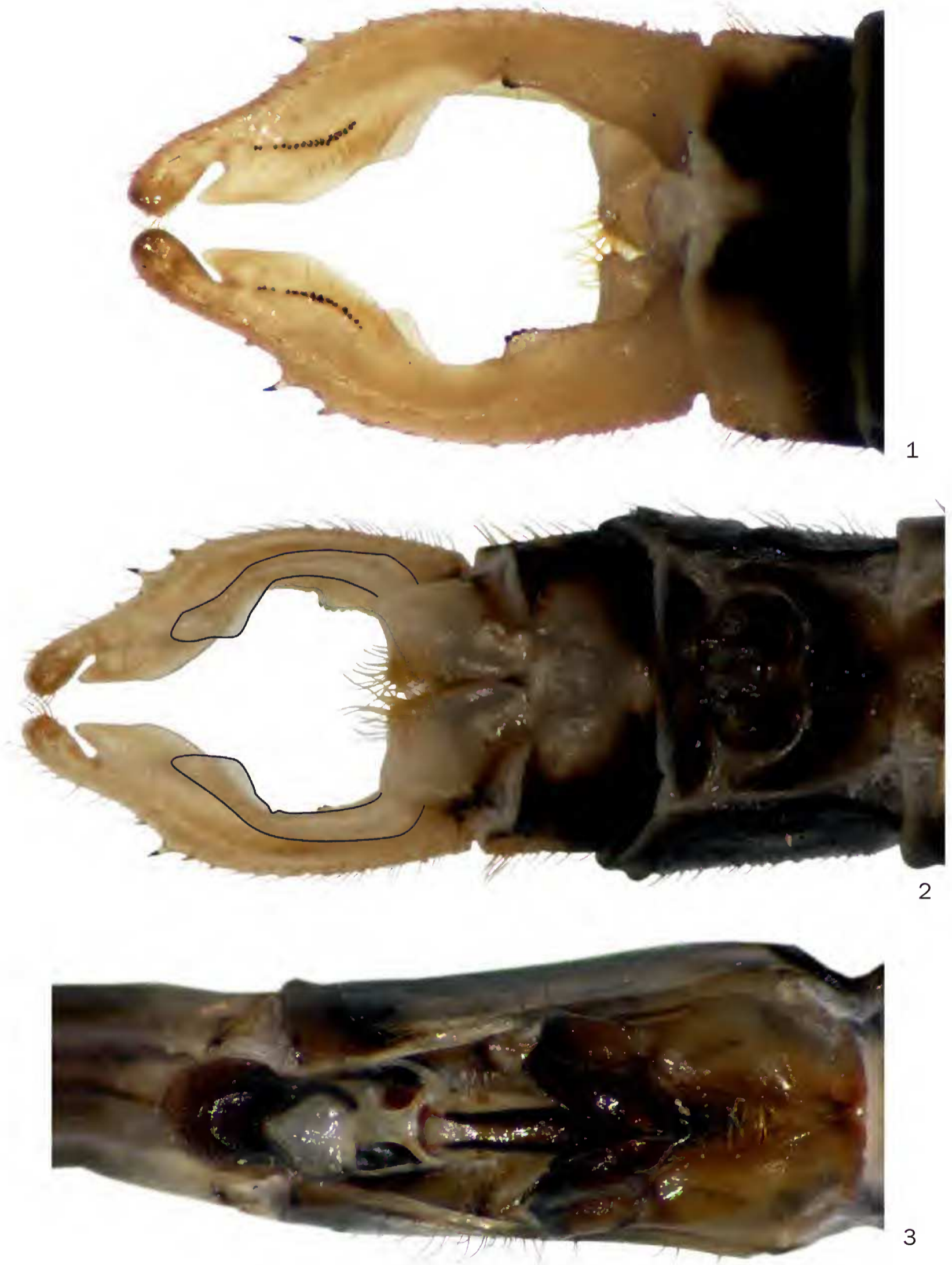
KALNIŅŠ, M.: *Argiolestes zane* sp. nov. from New Guinea (Odonata: Argiolestidae)



Figures 1-3. *Argiolestes zane* sp. nov. 1 – Thorax, lateral view (specimen in the collection already lost its blue coloration); 2 – Right wings, dorsal view (holotype); 3 – Right wings, dorsal view (paratype).

Plate 33

KALNIŅŠ, M.: *Argiolestes zane* sp. nov. from New Guinea (Odonata: Argiolestidae)



Figures 1-3. *Argiolestes zane* sp. nov., holotype ♂. 1 – Tip of abdomen, ventral view; 2 – Tip of abdomen with outline of the inferior appendages intensified in pencil, ventral view; 3 – Male accessory genitalia, ventral view.

Plate 34

KALNIŅŠ, M.: *Argiolestes zane* sp. nov. from New Guinea (Odonata: Argiolestidae)

1



2



Figures 1-2. Habitats in locus typicus of *Argiolestes zane* sp. nov. 1 – Small forest stream where holotype was caught (photo: M. Kalniņš); 2 – Small forest stream where paratypes were caught (photo: M. Kalniņš).